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10/761,667	01/21/2004	Kenneth Dong	291359.126US2	3419

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WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
RASHID, DAVID	

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

michael.mathewson@wilmerhale.com
teresa.carvalho@wilmerhale.com
sharon.matthews@wilmerhale.com

Office Action Summary	Application No.	Applicant(s)	
	10/761,667	DONG ET AL.	
	Examiner	Art Unit	
	DAVID P. RASHID	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,7-10,12-15 and 17-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7-10,12-15 and 17-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

[1] All of the examiner's suggestions presented hereinafter have been assumed for examination purposes, unless otherwise noted.

Continued Examination Under 37 CFR 1.114

[2] A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 5, 2008 has been entered.

Amendments

[3] This office action is responsive to the claim and specification amendment received on June 5, 2008. Claims 1, 3-5, 7-10, 12-15, and 17-19 remain pending.

Drawings

[4] The replacement drawings were received on June 5, 2008 and are acceptable. In response to applicant's drawing amendments and remarks, the previous drawing objections are withdrawn.

Claim Rejections-35 USC § 102

[5] The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

[6] **Claims 1, 4-5, 7-10, 13-15,** and **17-20** are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,995,639 (issued Nov. 30, 1999, *hereinafter* "Kado et al.").

Regarding **claim 1**, *Kado et al.* discloses a method of processing an image of a face, the method comprising (fig. 1; fig. 14; fig. 11 with "Brightness Correction", 7:23-52) the steps of:

receiving a two dimensional facial image (fig. 14, item 2; "Input image" in fig. 11), the facial image having been captured from a viewpoint (fig. 14, item 2 and "Input image" in fig. 11 are both captured from a viewpoint; *see* Response to Arguments);

combining the two dimensional facial image and a standard three dimensional facial image (fig. 14, item 14; "Standard structure model" in fig. 11) to create a modified three dimensional facial image (fig. 14, item 16; "Adjusted structure mode" in fig. 11 before brightness correction step 19 in fig. 14; both having been modified);

adjusting an orientation of the modified three dimensional facial image (fig. 14, item 19 wherein the changing of the "orientation" is brightness correction as detailed in 7:23-52, the change is light reflectance off the three-dimensional facial image is an adjustment in orientation with respect to the light; *see* Response to Arguments) with respect to the viewpoint (the orientation adjustment occurred using the original facial image viewpoint); and

rendering a two dimensional image ("Adjusted structure model" in fig. 11 after brightness correction step 19 in fig. 14 is a two dimensional facial image when displayed on the two dimensional display 5, the image data itself representing the "Adjusted structure model" in

fig. 11 after brightness correction step 19 is also two dimensional) from the adjusted three-dimensional image.

Regarding **claim 4**, *Kado et al.* discloses the method of claim 1, wherein the combining step includes the steps of:

combining the two dimensional facial image (fig. 14, item 2; "Input image" in fig. 11) and standard three dimensional facial image (fig. 14, item 14; "Standard structure model" in fig. 11) to create a first intermediate three dimensional facial image (fig. 14, item 15; 3:48-54);

rendering a first intermediate two dimensional facial image ("S. M. Adjust" in fig. 14, item 15 is a two dimensional facial image when displayed on the two dimensional display 5, the image data itself representing item 15 is also two dimensional) based upon the first intermediate three dimensional facial image;

comparing (fig. 14, item 16; "Feature amount extraction" in fig. 11; 3:66-4:7) the first intermediate two dimensional facial image to the two dimensional facial image; and

modifying ("Adjusted structure mode" in fig. 11 INCLUDING brightness correction step 19 in fig. 14) the first intermediate three dimensional facial image based upon results of the comparison step.

Regarding **claim 5**, *Kado et al.* discloses the method of claim 4, wherein the combining step further includes the step of repeating the rendering, comparing, and modifying steps a plurality of times (If not already inherent, it is implicit that the complete algorithm for identifying a person as taught by Kado will be performed more than once on microcomputer 3, thus the combining step wihtin the complete algorithm will repeat the rendering, comparing, and modifying steps a plurality of times.).

Regarding **claim 7**, *Kado et al.* discloses the method of claim 4, further comprising the steps of: rendering a final two dimensional image from the three dimensional facial image according to a selected lighting (brightness correction as detailed in 7:23-52).

Regarding **claim 8**, *Kado et al.* discloses a facial identification method (fig. 1; fig. 14; fig. 11 with "Brightness Correction", 7:23-52) comprising the steps of:

receiving a two dimensional facial image (fig. 14, item 2; "Input image" in fig. 11), the facial image having been captured from a viewpoint (fig. 14, item 2 and "Input image" in fig. 11 are both captured from a viewpoint; *see* Response to Arguments);

creating a three dimensional facial image (fig. 14, item 16; "Adjusted structure mode" in fig. 11 before brightness correction step 19 in fig. 14) from the two dimensional facial image;

adjusting an orientation of the three dimensional facial image (fig. 14, item 19 wherein the changing of the "orientation" is brightness correction as detailed in 7:23-52, the change is light reflectance off the three-dimensional facial image is an adjustment in orientation with respect to the light) with respect to the viewpoint (the orientation adjustment occurred using the original facial image viewpoint);

rendering an adjusted two dimensional facial image ("Adjusted structure model" in fig. 11 after brightness correction step 19 in fig. 14 is a two dimensional facial image when displayed on the two dimensional display 5, the image data itself representing the "Adjusted structure model" in fig. 11 after brightness correction step 19 is also two dimensional) from the adjusted three dimensional facial image; and

comparing the rendered two dimensional facial image to at least one stored two dimensional facial image to determine a match (fig. 14, items 17, 18, "Results" ; 4:19-27).

Regarding **claim 9**, *Kado et al.* discloses the facial identification method of claim 8, wherein the comparing step includes:

comparing the rendered two dimensional image (the "Adjusted structure model" in fig. 11 is a two dimensional facial image when displayed on the two dimensional display 5) to a plurality of stored two dimensional facial images to determine a closest match (fig. 14, items 17, 18, "Results" ; 4:19-27).

Regarding **claim 10**, *Kado et al.* discloses the facial identification method of claim 8, wherein the step of creating a three dimensional facial image (fig. 14, item 16; "Adjusted structure mode" in fig. 11 before brightness correction step 19 in fig. 14) includes the step of combining the two dimensional facial image (fig. 14, item 2; "Input image" in fig. 11) and a modified standard three dimensional facial image (fig. 14, item 14; "Standard structure model" in fig. 11) to create a three dimensional facial image.

Regarding **claim 13**, *Kado et al.* discloses a system for an identifying an individual (fig. 1; fig. 14; fig. 11 with "Brightness Correction", 7:23-52) comprising:

a camera (fig. 1, items 1, 2) for acquiring a two dimensional facial image (fig. 14, item 2; "Input image" in fig. 11);

means for creating a three dimensional facial image (fig. 14, item 16; "Adjusted structure mode" in fig. 11 before brightness correction step 19 in fig. 14) from the two dimensional facial image with respect to a viewpoint of the camera (fig. 14, item 2 and "Input image" in fig. 11 are both captured from a viewpoint);

means for adjusting an orientation of the three dimensional facial image (fig. 14, item 19 wherein the changing of the "orientation" is brightness correction as detailed in 7:23-52, the

change is light reflectance off the three-dimensional facial image is an adjustment in orientation with respect to the light) with respect to a viewpoint (the orientation adjustment occurred using the original facial image viewpoint) of the camera;

means for rendering a final two dimensional image ("Adjusted structure model" in fig. 11 after brightness correction step 19 in fig. 14 is a two dimensional facial image when displayed on the two dimensional display 5, the image data itself representing the "Adjusted structure model" in fig. 11 after brightness correction step 19 is also two dimensional) from the adjusted three dimensional image; and

means for comparing the final two dimensional image to at least one stored two dimensional image to determine a match (fig. 14, items 17, 18, "Results" ; 4:19-27).

The means-plus-function language supports computer/software interaction (fig. 1 of the present application) and is fully anticipated by the computer/software interaction as disclosed by Kado (fig. 1).

Regarding **claim 14**, *Kado et al.* discloses the system for identifying an individual according to claim 13, further comprising:

a database of stored two dimensional images (fig. 14, item 17); and

wherein the means for comparing includes means for comparing the final two dimensional image to at least one stored two dimensional image in the database of stored two dimensional images (fig. 14, items 17, "Results").

Regarding **claim 15**, *Kado et al.* discloses the system for identifying an individual according to claim 14, wherein the means for comparing includes means for comparing the final

two dimensional image to a plurality of stored two dimensional images in the database to determine a closest match (fig. 14, items 17, 18, "Results" ; 4:19-27).

The means-plus-function language supports computer/software interaction (fig. 1 of the present application) and is fully anticipated by the computer/software interaction as disclosed by Kado (fig. 1).

Regarding **claim 17**, claim 7 recites identical features as in claim 17. Thus, references/arguments equivalent to those presented above for claim 7 are equally applicable to claim 17.

The means-plus-function language supports computer/software interaction (fig. 1 of the present application) and is fully anticipated by the computer/software interaction as disclosed by Kado (fig. 1).

Regarding **claim 18**, claim 4 recites identical features as in claim 18. Thus, references/arguments equivalent to those presented above for claim 4 are equally applicable to claim 18.

The means-plus-function language supports computer/software interaction (fig. 1 of the present application) and is fully anticipated by the computer/software interaction as disclosed by Kado (fig. 1).

Regarding **claim 19**, *Kado et al.* discloses a system (fig. 1; fig. 14; fig. 11 with "Brightness Correction", 7:23-52) for creating a three dimensional facial image of a face (fig. 14, item 18; "Adjusted structure mode" in fig. 11 after brightness correction step 19 in fig. 14) from a two dimensional facial image (fig. 14, item 2; "Input image" in fig. 11) comprising:

a memory (fig. 1, items 3, 4) storing a standard three dimensional facial image (fig. 14, item 14; "Standard structure model" in fig. 11);

means for adjusting an orientation of the standard three-dimensional facial image (fig. 14, item 19 wherein the changing of the "orientation" is brightness correction as detailed in 7:23-52; it can also be argued that the orientation of the standard three-dimensional facial image is also adjusted from item 14 to item 15 of fig. 14 to "perform[[s]] deformation and adjustment of the standard structure model" in 6:27-28, the change is light reflectance off the three-dimensional facial image is an adjustment in orientation with respect to the light; see argument below for orientation adjustment) of the face with respect to a viewpoint of the face; and

means for combining (fig. 14) the two-dimensional facial image and the adjusted standard three dimensional facial image of the face to create the three dimensional facial image (fig. 14, item 18; "Adjusted structure mode" in fig. 11 after brightness correction step 19 in fig. 14) of the face.

The means-plus-function language supports computer/software interaction (fig. 1 of the present application) and is fully anticipated by the computer/software interaction as disclosed by Kado (fig. 1).

Regarding **claim 20**, claim 4 recites identical features as in claim 20. Thus, references/arguments equivalent to those presented above for claim 4 are equally applicable to claim 20.

The means-plus-function language supports computer/software interaction (fig. 1 of the present application) and is fully anticipated by the computer/software interaction as disclosed by Kado (fig. 1).

Claim Rejections-35 USC § 103

[7] The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

[8] **Claims 3** and **12** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kado et al.* in view of U.S. Pub. No. 2002/0013684 (published Jan. 31, 2002, *hereinafter* "Toyama et al.").

Regarding **claim 3**, while *Kado et al.* discloses the method of claim 1, *Kado et al.* does not teach wherein the standard three dimensional facial image is generated by receiving a plurality of three dimensional facial images and combining the plurality of three dimensional facial images to generate the standard three dimensional facial image.

Toyama et al. discloses a method for modifying a standard model (fig. 1; fig. 11) wherein the standard three dimensional facial image(fig. 11, items 37, 38) is generated by receiving a plurality of three dimensional facial images and combining the plurality of three dimensional facial images to generate the standard three dimensional facial image (fig. 11, items 39).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step of creating a standard three dimensional facial image of *Kado et al.* to be generated by receiving a plurality of three dimensional facial images and combining the plurality of three dimensional facial images to generate the standard three dimensional facial image as taught by *Toyama et al.* "...to provide a method for generating a shape model that enables to have a part of a three-dimensional model such as a corner of an eye or a corner of an eye or a

corner of a mouth conformed to that of an object without topical improper modification.", *Toyama et al.*, paragraph [0016].

Regarding **claim 12**, claim 3 recites identical features as in claim 12. Thus, references/arguments equivalent to those presented above for claim 3 are equally applicable to claim 12.

Response to Arguments

[9] Applicant's arguments filed on June 5, 2008 with respect to **claim 8** have been respectfully and fully considered, but they are not found persuasive.

Summary of Remarks regarding **claim 8:**

Applicant argues that in "Argument 2" of the Advisory Action, the examiner maintained that, even if adjusting a "pose" of the facial image were defined as geometrically adjusting the head shown in the image, the claim would still be anticipated by Kado because Kado discloses a relative shift between a face and the face's lighting, which he alleged could be an example of a pose adjustment. However claim 8 requires adjusting the "orientation of the three dimensional facial image with respect to the viewpoint," [emphasis added] which is clearly not the same as an adjustment that merely changes the relative position between a head and its lighting. As an example of the difference, consider a part of the face, such as the nose in an image captured from a 45 degree angle. An adjustment of the lighting of the nose may alter the shading and color of the nose, but cannot alter the shape of the nose in the image, which remains at a 45 degree angle. However, an adjustment of the orientation of the nose with respect to the viewpoint changes the angle of the nose, so that it could, for example, appear face on, which corresponds to a change in the shape of the nose in the image. Nowhere in Kado is there even a mention of adjusting a three

dimensional facial image with respect to a viewpoint from which the image was captured. (Applicant Resp. at 7-8, Jun. 5, 2008.)

Examiner's Response regarding **claim 8:**

However, similar to the argument of the word "pose", adjustment of an "orientation" is not limited to only a geometric transformation that would require performing a rigid rotation on a three dimensional image. *See* Resp. at 7 (giving an example of a difference between brightness correction of a nose according to the prior art of record, and geometric orientation of the nose). The Examiner agrees that the nose would not undergo geometric transformation under brightness correction of *Kado et al.*, but a more strict interpretation of the use of the word "orientation" to only limit to some strict form of geometric orientation would be needed.

A plausible definition of "orientation" supports that "[t]he orientation of a rigid body in space is the choice of positioning it with one point held in a fixed position". *See* Wikipedia *available at* http://en.wikipedia.org/wiki/Orientation_%28geometry%29. "Brightness adjustment" of *Kado et al.* directly suggests two possibilities, both anticipating the claims.

(1) If the light source in *Kado et al.* is fixed in position, then altering the brightness on the "adjusted structure model" would directly reflect a change in position with respect to the face, and thus orientation adjustment of the modified three dimensional facial image with respect to the viewpoint (the viewpoint being the fixed light source position).

(2) If the light source in *Kado et al.* is not fixed in position but the face itself is fixed in position, then altering the brightness on the "adjusted structure model" would directly reflect a change in position with respect to the light source, and thus orientation adjustment of the

modified three dimensional facial image with respect to the viewpoint (the viewpoint now being the fixed facial image).

Conclusion

[10] Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID P. RASHID whose telephone number is (571)270-1578. The examiner can normally be reached Monday-Friday 7:30-17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-74155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

David P Rashid
Examiner
Art Unit 26244

/Vikkram Bali/
Supervisory Patent Examiner, Art Unit 2624